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Engineers and Founders

BALTIMORE **NEW YORK**

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Where it is desired to show a record of temperatures or pressures for an extended period of time and where the cycles of operation are of relatively short duration, requiring a wide, open record in order to see the slightest variations, the Columbia Strip Chart Recorder will be found invaluable.

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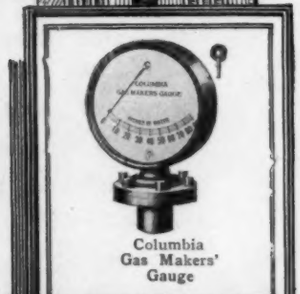
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Columbia

Strip Chart Recorder

is especially adapted for measuring ash-pit pressure of water-gas machines. As the chart travels at a speed of 6 inches per hour, it shows a picture of the complete operations and enables the superintendent to discover the slightest irregularities in timing of the various valve changes, upon which depend the quantity and quality of gas made.

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THE SCHAEFFER & BUDENBERG MFG. CO.
AMERICAN STEAM GAUGE & VALVE MFG. CO.
HOHMANN-NELSON COMPANY

Brooklyn, N. Y.

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American Gas Journal

SIXTY-FIFTH YEAR

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"APPLICANT FOR MEMBERSHIP IN THE AUDIT BUREAU OF CIRCULATIONS"

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Fuel of the Future. What Shall It Be?

XVII. Heat treatment of metals—Annealing of steel

Ismar Ginsberg

THIS is the third article in the series on the heat treatment of metals. In the first article an account was given of the economic conditions that surround the use of fuels in the heat treatment industry, or rather in the manufacture of parts of machines, automobiles and the like, tools, etc., in which heat is employed in the manufacturing process. The economic phase of the business must be constantly borne in mind throughout these articles on heat treatment, as the entrance of gas into this field and its successful competition with other fuels rests mainly, it may be held, on the proper understanding of the economic factors that govern the business.

In the second article of the series on this special subject, the general basic principles of heat treatment were briefly discussed and considerable attention was paid to the relation between heat treatment and the properties of steel. It must not be inferred from this that our treatment of this subject will be entirely limited to steel, for other metals as well are put through heat treating processes to enhance their value and produce in them certain desirable properties. But it is a fact that steel is the most important of all metals as far as heat treatment is concerned, for most of the articles, such as tools, knife blades, crank shafts, springs, gears, pinions, and all the multitudinous parts of machines and apparatus of all kinds are made from steel. Hence the major part of our discussion on heat treatment must be concerned with the metal, steel, and after that is concluded the other metals will be discussed.

Effect of Heat Varied

It has been pointed out that the effect of heat on steel is of a varied nature, dependent to a large degree on the manner in which the heat treatment is carried out. It has been shown how the properties of steel are affected by the application of heat and the cooling of the metal thereafter. It has been indicated that both the mode of heating and of cooling is of prime importance in determining what particular effect will be produced in the finished metal. Attention has also been paid in a brief way to the structure of steel and the relation between its structural components and the effect of heat.

We are now ready to consider each heat treating process, but before doing so it is necessary and advisable to spend some time in discussing the most important characteristic of all heating processes. This is precision.

The Necessity for Precision

It has been mentioned heretofore that one of the principal features of heat treating processes is the regulation of the temperature during the heating. In other words, precision in the treatment of the metal is of prime importance, and it is only that fuel which enables the operator to attain this precision without any great difficulty and without any danger to the product that will be able to enter this field and stay there, in spite of all newcomers. Gas has this particular advantage, and furthermore, its economic character is such that it must surpass electricity as a fuel for heat treatment purposes.

The necessity for precision in heat treatment is simply due to the fact that unless this is possible the proper degree of hardness and fineness of grain will not be obtained in the steel product, whether it be ordinary steel or alloy steel. In every well-designed furnace means are provided for accurately and rapidly determining the temperature of the product within the furnace.

The gas man may have to test his fuel along these lines. It is therefore called to his attention that one of the main points to look out for is the proper lo-

cation of the thermo-couple which reads the temperature of the product. It must be placed in such a position that the temperature of the product and not of the oven itself is read. This is important, for the simple reason that the temperature of the hot gases in the furnace may be at least 100 degrees higher than of the steel itself. It is recommended that the thermo-couple be allowed to rest directly on the metal itself. In this way an accurate idea of the temperature of the steel will be obtained.

Temperature Control in Pots

The heat treatment of metal in pots requires even greater care to determine the correct temperature. Thus it is well to determine in advance the correct temperature to which the pot must be heated in order that the steel will be properly heat treated. In fact, throughout all heat-treating processes, the greatest of care must be taken to see that the temperature of the metal is properly recorded and the admission and combustion of the fuel is under perfect control so that the best results will be obtained with the furnace. Of course, a great deal depends on the manner in which the furnace is constructed and on the skill of the operator, but if the fuel that is employed cannot be properly and easily controlled it makes really no difference how much attention is paid to other details, the results will not be forthcoming.

Thus again it must be clear to the gas engineer that he is here entering a field in which accuracy is of the highest significance. He is entering a field within which strict scientific control of process is exercised and in which a profound knowledge of the minute details of the processes are possessed by those who operate them. He cannot, therefore, even think of commencing to talk gas to these people without first becoming well-versed in all the important details of the process so that he can speak to them in their own language and understand what is being talked about.

This is a point of prime importance and it is too often that the gas engineer, eager to make a sale of gas as an industrial fuel, starts off to sell his prospect before being perfectly familiar with all the factors and conditions that he will run up against in trying to supplant by gas a fuel which may have been used in the plant for years. This is the main reason why so much time is being spent here on the details of the heat-treating process. It may appear that what will be said in the following is somewhat afield from gas, but the industrial man, who attempts to sell gas as a heat-treating fuel, will have to have a working knowledge of those details before he can speak understandingly to his prospect.

A Gas Annealing Furnace for Nickel

Annealing of Steel

The first process coming up for discussion in the heat treatment is annealing. There are many different purposes for which this process is carried out and in any single machine part or any single steel product any or all of these effects may be looked for

(Continued on page 61)

How Are You Going to Do It?

What makes advertising stutter?

William H. Matlack

ON several occasions the writer has been told that the manufacturer has been keenly disappointed by the manner elaborate advertising schedules, which he had had prepared, were handled by the dealer. As we remember it, the complaints, if they may be regarded as such, resolved themselves to the following three:

A. The dealer will order a complete campaign, from booklets to window trims, including mats, or electros, and only use about half of it.

B. The dealer will not use the advertisements we prepare for him.

C. The dealer will use only one or two ads. and a few booklets.

How do you figure it out?

There is, of course, more than one answer to these questions, although after talking with dealers and from past experience in the retail field we believe the main reason the dealer does not use the manufacturer's complete "set up" is that the manufacturer fails in a great many instances to observe the three cardinal points necessary to assure any degree of success in advertising and the full co-operation of the dealer when preparing this material:

The Three Cardinal Points

The first is that the copy must be such as will fit into what may be called local atmosphere. Every dealer has a local condition to meet, and copy must fit in. By fit we mean size, even with low space rates. The small dealer can ill afford to splurge in space; he, like the large city dealer, must work out his advertising appropriation on sales volume and he usually wants to spread his ads. over as many days or weeks as possible.

This is as it should be, too, for, after all, it is the dealer's money that pays for the space the advertising occupies. That copy and illustration must give the dealer full play, there can be no question. A morticed electro that provides the dealer with just enough space for his name and address will not go over as well, if used, as freely as what gives the dealer a little the best of it.

The illustration and text must be designed and written from the dealer's angle. John Smith, whose town contains but 10,000 to 25,000 people, most of whom he knows to speak to, do not talk to folks in the same language as that employed by S. P. Dix, the copy writer in the big city agency. Dix talks in the copy for the manufacturer, while Smith must talk for Smith.

These are the basic reasons why some of the elaborate costly advertising plans are not fully used. Why they stutter when the average dealer wants them to talk to folks!

How to Remedy the Situation

Now comes the question, what are you going to do about it? How can the manufacturer stop the waste and at the same time give the dealer a co-operative advertising service that he will use?

This calls for another answer. Basing our argument on the above discussion, let us look at it in this way. The manufacturer wants to co-operate with the dealer in the matter of advertising service clear down the line; he wants to work out a plan whereby the dealer will tie-in locally with his national advertising, where both he and the dealer will reap all the advantages that accrue from such co-operative effort.

Take for illustration newspaper advertising only, and assume for lack of space and for discussion here that show cards, window trims and direct mail advertising are O. K.

Newspaper Advertising

The manufacturer has first to build his plan, a plan flexible enough to fit into each and every city where he has dealer representation. The plan must consider the smallest dealer and the largest, the basis being derived from such factors as size of city, location and sales volume. This done, he must decide how he will present and sell the dealer his plan. He must decide whether he will make no charge and buy space or whether he will furnish cuts and copy and let the dealer buy space and place his own advertising or whether he will charge the dealer a fixed sum per complete campaign and attend to all the details himself.

These things are all important and no two dealers or manufacturers are agreed as how to do it. For that reason we are going to tell of some of the plans we have seen in use which manufacturers and dealers thought were satisfactory.

One Successful Plan

A washing machine company selling dealers direct and through jobbers worked out a plan whereby the manufacturers would furnish cuts and write copy for the dealer (who purchased a certain quota, the minimum of which was 50 machines) and pay for advertising placed by the dealer at a rate based on a flat allowance per machine ($3 on a machine that sold retail for $160).

Another washing machine company performed a like service for its dealers and made an allowance on a fixed per cent basis per machine. In both cases credit was given against copies of newspapers containing the ads. and in both cases the salesman, selling the machines, also sold the advertising plan and co-operated with the dealer in preparing, placing and ordering the advertising. The advertising department also worked hand-in-hand with the dealer

and upon suggestions offered in the salesman's report.

Other manufacturers send out several plans (complete) for the dealer to choose from, and furnish all material so ordered free, and leave the matter of placing entirely up to the dealer.

The Right Copy

The whole problem resolves itself down to the working out of a plan which has the right copy, giving the dealer a little the best of the space, and in having the salesman sell the co-operative plan to the dealer on a basis of knowledge of the man and his market.

The above campaigns were offered by electric appliance manufacturers, but are such as may be employed equally as well to sell gas ranges or water heaters. The big thing as we see it is to give the dealer what he wants, after the manufacturer has made a thorough and complete investigation of what he should have, applying the law of averages, from what has been sold him by the manufacturer's sales representative.

Applied to Gas

To illustrate just what we mean in this regard: A certain gas company in a southern city wanted to conduct a range campaign and accordingly got in touch with the advertising department of a large range manufacturer. The gas company wrote in detail about what they expected to do, giving the number of salesmen, the number of customers, and stated that the advertising would be of a certain number of inches, published daily, a week before the sale, and a certain number of inches daily each day during the sale. They gave the number of customers to whom they intended to send direct advertising, the full details, in fact, including dates. The manufacturer came right back: "We are assembling

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GAS AND FOREST FIRE PREVENTION

The above shows how out West the gas company co-operates with the United States Forestry Department in spreading the propaganda to be more careful in the casting away of burning matches or cigarette stubs.

While they do not swelter in Portland, Oregon, like they do in the East, their delightful summers are sometimes made less attractive by the hazy smoke in the far distance caused by forest fires thereby not only destroying valuable timber, but preventing the tourists from seeing the beautiful scenic surroundings of western Oregon.

Gas and Forest Fire Prevention

Selling Heavy Duty Hotel Appliances*

A field primarily for gas and how to cover it

C. H. French

THE field in which to sell heavy duty hotel gas ranges and other appliances where food has to be cooked in large quantities seems to be almost unlimited.

In some cities the gas companies have gone after this business to a greater extent than others, and from observation those who have had the largest success in getting this desirable business are those who have had men specially trained and devoting their entire time to securing this class of consumer.

There is still a big percentage of hotel and restaurant operators and those in charge of large institutions that persist in thinking that it is impractical to do large volume cooking with gas.

Gas vs. Coal

In most cases they make a comparison on a basis of a pound of coal as against a cubic foot of gas and do not take into consideration the many advantages gas equipment has over coal, nor do they figure in all the expenses that actually should be charged against the operation of their coal and charcoal appliances.

Where coal burning appliances are used there is a constant expense for supplying new tops, grates, fire brick, linings and a general overhauling of the appliances once or twice a year. The daily handling of coal and ashes, which creates considerable dirt and annoyance, to say nothing of the time spent by a man doing this work, plus his keep—must be considered and charged against coal installation. The continued renewing of ash cans, brooms, shovels, coal buckets, cartage of ashes, etc., amounts to considerable in a year, and are also chargeable against the coal operated kitchen.

Disadvantages of Coal

It is a fact that where coal burning appliances are used it makes the kitchen hotter for the chefs to work in, as the room never has a chance to cool off, even in the non-rush hours, as the coal fires have to be kept continually burning and in readiness for the next meal. The heat from the coal ranges going into the flues which run up through the house very often has a tendency to heat the guest rooms, especially in the summer, when they should be kept as cool as possible.

"Recently a case reported, where coal appliances were used, made several rooms over the kitchen so hot that most of the year they could not be rented. The rental loss of these rooms, figured at one dollar per day, would pay for considerable gas in a year. The occupants of other rooms facing on the rear court of this same building were annoyed early in the morning by men carrying out ashes and the usual noise made in handling ash cans. The pointing out to the manager of the hotel these two facts had more to do with changing his kitchen over to gas than any other argument presented to him, and it was only by chance that the gas appliance salesman learned of these conditions by overhearing guests complaining to the room clerk while waiting to see the manager, whom he had tried for nearly two years to interest in a gas installation.

Gas the Ideal Fuel

Gas is the ideal fuel for hotels and restaurants and wherever food is cooked in large quantities or in great varieties. The very nature of this fuel adapts itself to meet any cooking requirements. Any desired heat can be obtained almost at a moment's notice by the simple operation of turning on or off a valve. It is a time and labor saver, it is a clean fuel, and most efficient for either slow or fast cooking, and economical as to cost when used in the PROPER KIND OF APPLIANCES for the work to be performed. The kind of appliances used is a big factor as to whether the operating or fuel cost is to be low or excessive.

Replacing of Old Types

The subject so far has been mostly on the converting of coal operated kitchens over to gas, but there is still another field which should be given attention, and that is the replacing of old types of gas equipment for those which are more modern, efficient and economical in their operation.

One of the best advertisements gas as a fuel can have is satisfied users; therefore, the lower their operating costs are, the more gas they will be inclined to use for other purposes, as well as advertising others to use it. This being a fact, it is logical then to see that the appliances in use are the most efficient and economical, and the old types discarded.

The argument will possibly arise when the prospect is approached on the subject of throwing out his old equipment, that it is still in good condition and would last him for several years more. However, if you can show him that his work can be done better, quicker and for less cost, he will be interested, and especially so if he can be shown that the saving in gas for a period of twelve months would probably pay for the new installation. This is being done all over the country by installing the newer and proper kinds of appliances for the particular work to be done.

Some Data from Princeton

I believe some data given by the Princeton University, which institution was converted several years ago from coal to gas for cooking, would be of interest.

The approximate number of meals served to students from January 1 to July 1 was 568,080. The average monthly gas bill for the same period was

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*Delivered at the January 9th meeting of the Gas Sales Association of New England, Boston, Mass.

$268, which would figure (.0029) about one-quarter of a cent for fuel per meal cooked. This figure included as well all the baking of bread, rolls, pies, cake, etc. There are about 1,400 students who eat at the university dining halls, and to give some idea of the amount of several kinds of food that has to be purchased and cooked we will quote data given by the manager:

"The eggs consumed in a school year of nine months by the students, according to figures compiled, if placed end to end, would form a line reaching from Princeton, N. J., to New Haven, Conn. The average student eats two and one-half times his own weight in meat during the academic year. The eggs consumed during the nine months of the school year are 324,000, or 3,000 dozen per month. During this period 450,000 pounds of meat are used, which would be about 23 tons per month. In addition to this are the vegetables, breads and other foodstuffs, all of which are cooked with gas."

Construction of the Range

Gas ranges for hotel work must be built of the best material and embody the best workmanship, as they are subjected to long hours of use and, in most cases, very rough handling.

Gas ranges for heavy duty work must be constructed from the ground up with the idea that the fuel to be used is a gas and not a liquid (oil) or a hard fuel such as coke or coal. Ranges designed to use the latter are not capable of giving quick results, nor can they be controlled from a moderate to an intense heat with the ease of a range scientifically designed to burn gas. Any appliance built to burn coal, whether it be a house heater, water heater, incinerator or cooking range, cannot be converted into a gas-burning appliance and give the high efficiency and be operated at as low a cost as one especially designed for the use of gas.

From observation and long years of experience we have found that the chef's ideas as to what is required in making an appliance give the best results, have in most cases been successful

Chef's Ideas Followed

For instance, some years ago, several of the best chefs in New York stated they did not like the ordinary open flame gas ranges manufactured at that time, as it required too much watching of the pots to keep them from boiling over, burning the food and clogging up the burners. What they wanted, if they did use gas, was a range constructed with a hot center fire under a solid or closed top, similar to a French top hotel coal range. They preferred this type for several reasons.

First, because it is the design of coal range that has been in use for many years past and the type that most trained chefs and cooks have been taught on. Second, because it afforded better cooking conditions and enabled them to move pots and kettles to a series of graduated heats after the contents had been brought to a cooking point. Experience has taught that if we hoped to interest the exacting type of chef or cook, this design of range was necessary.

In the past three years the improvements in construction, efficiency and economy embodied in heavy duty hotel ranges have been marked and it would be well for those interested in the sale of this class of appliance to become thoroughly familiar with the newer and improved types, so that only the very latest design be advocated to the prospective buyer.

Proper Installation and Gas Supply

A very important factor in the installation and successful operation is to have proper size piping so that an adequate supply of gas, as well as pressure, is available at all times and also that proper flue and ventilation be provided.

Many good gas installations have been made that have not been satisfactory, for the reason that the proper supply of gas was not run to the equipment. This is sometimes due to the fact that the plumber of the kitchen equipment concern does not understand the local gas conditions. Therefore, in order to get the best results, it is always wise for them to confer with the local gas company and have one of their engineers look into the requirements and his recommendations be followed.

Gas companies should be interested and willing to assist in helping others who have contracts to install gas equipment, regardless of the fact that they did not sell the appliance. This kind of co-operation is beneficial to all concerned and is recognized and appreciated by the hotel men and other gas customers.

Maintenance

Some gas companies find it advantageous to give free maintenance and monthly or semi-monthly inspection of heavy duty appliances in their territory. This free maintenance service includes the cleaning and keeping the burners in proper adjustment, but does not include supplying repair parts, which are charged for at cost plus a percentage to cover handling charges, etc. This free service has several advantages for the gas company; not only does it keep the consumer satisfied, but it eliminates complaints coming into the office which have to be handled by the clerical force and go through the same routine as any other complaint. The service man, in making his round of inspection, is very often able to recommend the use of additional consuming appliances and to report the circumstances to the Sales Department.

Gas Rates

I believe it would be well, where gas companies are revising their gas rates and intend to have a sliding scale of prices, that it be so figured that the hotel, restaurant, club and institution would receive benefit over that of the ordinary consumer, and in cases where the consumption was large enough that they would figure in the same class as the large industrial consumer.

Gas vs. Electricity

The reason for bringing up the question of gas rates for this class of consumer is the fact that several of the hotel associations throughout the country are giving this matter a lot of consideration and feel at the present time that the rates are too high and in some places excessive.

(Continued on page 63)

PROGRESS IN GAS TECHNOLOGY
Domestic and Foreign

Thermal Conductivity of Metals

THE rate at which different metals conduct heat is a matter of moment to the gas engineer and to those who have to do with the design of apparatus in which gas is used as a fuel, not only for domestic, but for industrial purposes as well. A very interesting and exhaustive study has been made of the variation in the thermal conductivity, or the rate at which metals conduct heat, with the temperature, and the results have been published in Chaleur et Industrie, 1924, page 557. Various tabulations are given of metals such as aluminum, copper, tin, iron, steel and various alloys of these metals.

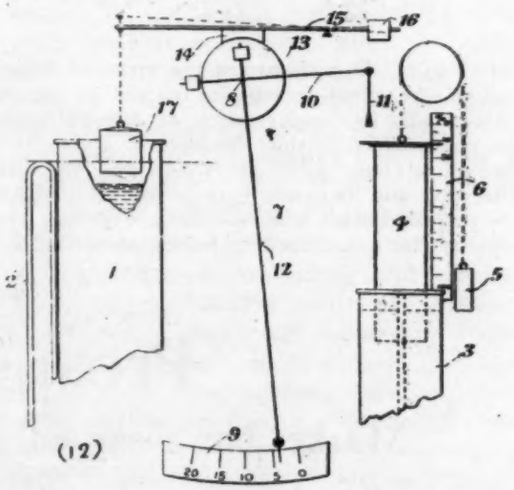
The conclusion drawn from the experiments was that the thermal conductivity of pure metals decreases first as the temperature increases and then as the temperature reaches normal the thermal conductivity starts to increase with further use in temperature.

Recording Gas Apparatus

THE apparatus comprises a water vessel 1 provided with a discharge syphon 2, and a gasholder 3 in which a bell 4 is adapted to be displaced during the analysis, the bell 4 being counterbalanced by means of a counterweight 5 and a graduated scale 6 being provided adjacent to the upper edge of the bell 4 which serves as an indicator. The indicating and recording pointer 7 is pivotally mounted at 8 and counterbalanced so as to tend to move towards the left over the graduated scale 9. The pointer is provided with an extending arm 10 substantially at right angles thereto, the extremity of the arm 10 carrying a rod 11 with the lower end of which the upper end of the bell 4 is adapted to engage. The pointer 7 is provided with a pen device 12 adapted to engage with a chart (not shown). The spindle on which the pointer 7 is mounted is provided with a brake drum 13 with which a brake block 14 carried by a pivoted lever 15 is adapted to engage, one arm of the lever 15 carrying a counterweight 16 and the other arm having suspended therefrom a weighted float 17 arranged in the upper end of the water vessel 1 adjacent to the highest water level therein attained.

In operation, during the interval between successive analyses or tests, the level of the water within the vessel 1 is rising and a sample of the gas to be analyzed is being passed through the absorbing reagent into the bell 4, which is accordingly also rising During this stage of the cycle of operation the brake block 14 is held in engagement with the brake drum 13 by the action of the weighted float 17 upon the lever 15, the braking pressure being regulated by means of the counterweight 16. The pointer 7 is retained in the position to which it has been moved as the result of the previously performed analysis or test until the water level in the vessel 1 rises to such a height as to lift the float 17 and release the brake block 14 from the brake drum 13. The pointer 7 is thus rendered free to move and the position of the pointer is readjusted if necessary by the engagement of the upper end of the bell 4 with the lower end of the rod 11.

If as a result of the test or analysis just performed the bell 4 rises to a greater height than that resulting from the previous test or analysis, the upper end



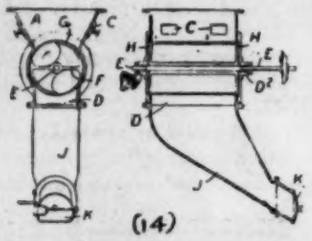
of the bell 4 will raise the rod 11 and displace the pointer 7 towards the right, whereas in the event of the bell 4 rising to a lower height than that corresponding to the previous test or analysis the pointer 7 when freed will move towards the left until the lower end of the rod 11 engages with the upper end of the bell 4 in its new position.

Upon the water in the vessel 1 reaching its highest level, the water will be discharged through the syphon 2, with the result that the weighted float 17 will descend and the brake block 14 will again come into engagement with the brake drum 13, thereby locking the pointer 7 in the new position to which it has been adjusted, this action taking place before the sample of gas is permitted to exhaust from the bell 4.

The timing of the operations can be readily effected, as the sampling burette of the apparatus working in conjunction with the water vessel 1 is provided with a capillary tube at its upper end and consequently at this point a small variation in the level of the water in the vessel 1 does not make any appreciable difference in the volume of gas caused to enter the bell 4. (British Patent No. 223,671.)

Removing Coke from Gas Retorts

THE apparatus which is shown in the illustration is for the purpose of removing coke from gas retorts. The coke or ash is discharged by means of a rotating valve, which is mounted on a shaft, E, which is built on a prolongation of the gas-making apparatus in such a fashion that it supports the mass of the combustible matter. The valve is made of the plates H at the extremities and a plate F, which is located transversely in the



(14)

valve casing, D, and carries the arms, G, which are curved, the curve facing the bottom of the casing. This results in the formation of compartments for the coke, which is thus discharged, and falls down through a chute, J, which is closed by the door, K. The valve and its casing may be conical in shape and are provided with a device for preventing any escape of the gas. Stuffing boxes, shown at D^2, are located on the shaft, E. The apparatus is patented in British Patent No. 197,732.

Purification of the Gas Before Use

In order to put the gas into good condition before it is used in the furnace or for other purposes around the plant, it is necessary to pass it through a dust catcher. In this apparatus the particles of dust that are carried along with the gas are removed in the ordinary way. A pipe line leads from the dust catcher direct to the holder or to the apparatus in which the gas is used. The gas may be preheated before it is burnt and when this is done the temperature of the combustion gases is found to be as high as 1,500 degrees C. even with very low thermal value fuel, while, if preheating is not resorted to, the temperature of the combustion gases is only as high as 1,000 degrees C.

The principal feature of this process is that it affords a means of removing all the disadvantageous features of low grade fuels that make it so difficult to burn them on the grate. Perhaps the most important of these properties is the high water content of the fuel, as high as 50 per cent. Very good results are obtained by carrying out the process in this manner and a good part of the fuel is eventually used for firing purposes in the form of gas with the important advantages that are gained when gas is burnt in place of solid fuel.

Prosperous 1925

Market has absorbed reserve stocks--Spring business promises well

L. W. Alwyn-Schmidt

IN starting this, the first monthly report for the year 1925, we shall be excused for dwelling, in brief, on the achievements of the Monthly Forecast of the Industrial Markets during the year 1924. We are glad to say that we have early in the year pointed to the possibility of a decline and have also forecasted correctly the autumnal recovery. Decline and advance, of course, it is all in the game. But we play it to better advantage if we guess correctly the hand held by fate.

The year 1924 has ended with a fair promise for future improvements. For the first time since many months manufacturers enjoy the pleasant feeling of seeing ahead more than a hand-to-mouth business. There is now every indication of a further increase in industrial activity.

Year of Surprises

The last year has been one of many surprises. It experienced a violent economic decline in the beginning, followed by a rather sluggish recovery, slow in the coming and very undecided in development. Such a situation may well prove a puzzle to business men and they have met it with unusual caution. As the result, there has been plenty of retrenchment, but there were only few fatalities. Even the boom activities of the stock exchanges following the presidential election has caused a mild interest among outsiders, making the piling up of stock exchange records a matter for professional speculators only.

It is extremely difficult to measure comparative market strength. Variations in the purchasing power of the money unit, the productive capacity of labor and other changing factors interfere in obtaining a perfect result. But allowing even for such imperfection in the method of measuring, it seems clearly proven that industrial production during the year 1924 has not kept step with the normal purchasing capacity of the nation.

(Continued on page 59)

As The Journal Views It

WHAT IF GAS WERE INVENTED AFTER ELECTRICITY?

In a recent issue of our distinguished French contemporary, "Le Gaz," there was published an editorial under the above title which contains material of considerable importance and interest to American gas men, as well as to gas men all over the world.

The question was asked: What would have happened if gas had been invented after electricity, instead of before, as the case actually is? What effect would this new invention, gas, have had on the "old well known electricity?" A comparison is drawn between the results that would have taken place, according to the viewpoint of the writer, and what has actually happened. And from that there was derived a lesson which is of prime significance to the gas industry of all countries.

Parts of this editorial have been translated and are published below:

"Let it be assumed that electricity has been used for a period of fifty years for lighting and for motive power, etc., and that suddenly, a new product, gas, comes upon the scene.

"I feel sure that we would have then seen the same events taking place as actually happened when electricity first entered the field. It could not be otherwise. For gas, when it would have been first introduced after electricity had been serving the field, would have been used for lighting, for heating, both in the kitchen and for space heating, as a motive power and for industrial heating as well.

"As far as light is concerned, gas, at the same price as electricity, but yielding a little stronger intensity of light, would have taken the lighting field by storm, not for this reason alone, but also because of the beautiful illuminating effects obtained with it. In fact, it is uncontestable that the light given by a perfectly designed gas burner is more agreeable to the eye than electricity, because it is whiter, while electricity always gives a slightly reddish light. Furthermore, there certainly would have been warm partisans among the eye hygienists, for this "new" system of lighting with gas does not possess, as electricity does, the disadvantage of containing the harmful ultra violet rays.

"As far as heating is concerned, gas would have been adopted at once, for the radiant gas fire would have made possible a complete series of heating apparatus for solving all heating problems. While it would have nothing to yield to the electric radiant fire from the important angle of usefulness and convenience, it could not be compared with it from an economic standpoint.

"All those concerned with heating problems would have been immediately in favor of gas, for with this fuel every special industrial heating problem could be solved. All the medical men and physicians would have praised gas for lighting and the economists would have recognized its value as fuel, inasmuch as gas is the most economic manner of utilizing the heat that is contained in coal. As for street lighting, gas, particularly in the small and average sized cities, would have immediately attained supremacy over electricity. Many advantages would have been seen in gas over electricity for this particular purpose."

In conclusion, the writer of this editorial has some very pertinent words to say to the gas men of France, which pertain as well to the gas men of America. We quote the conclusion in full:

"As is true with all other things, it is merely a question of style and newness as far as illumination is concerned. This good old gas of ours, which is criticised and called down so much these days, has advantageous qualities even from the standpoint of lighting. Gas men have submitted a little too placidly to this state of affairs. We do not make known to our customers in a sufficiently emphatic manner the advantages of the product we have for sale. We gas men suffer from the lack of inaction and we do not fight back strongly enough. This is our principal fault."

Thus closes this admirable editorial. Its entire purpose is to prove to the gas men that the reason why electricity got ahead of gas was not purely because of the advantages that this new form of en-

ergy possessed over gas. True enough, electricity has its advantages, but so has gas, and it is equally true that the gas man has not been so energetic in emphasizing these advantages to his customers as the electrical man has in bringing out the good points of his product.

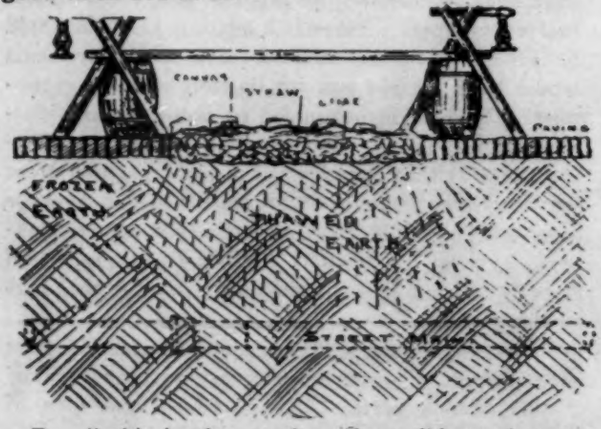
In other words, a new thing is always received with interest, and if proven at all to be possessed of the qualities that are claimed for it, it quickly becomes the vogue. If gas had been invented after electricity, we agree with the writer of the French editorial that there would have been largely the same condition of affairs as took place when electricity first appeared on the scene, and therefore supplemented gas to a large extent as an illuminating agent.

GAS WRINKLES

LIME FOR THAWING IN WINTER STREET WORK

The following scheme is well worth bearing in mind for use during the coming winter, should it be desired to draw the frost from frozen ground in order to get at a pipe beneath.

At the spot where it is determined to dig, lay out the size trench desired, and pick out the frozen surface to a depth of 8 or 10 inches. In the hole so made, put in enough unslacked lime to make a good thick bed of it.



Do all this in the evening, if possible, and, upon leaving, throw such a carefully judged quantity of water over the lime as will start it to "slacking" and yet will keep it "working" for the longest time possible during the night. Throw a lot of straw, if possible, and a canvas over the whole, weighting it with stones and boards, etc., around the edge to keep the heat in and any wind out, and leave until next morning. Upon then returning, it will be found that the heat generated by the slacking of the lime over night has drawn the frost out of the earth in and around the hole, to a depth of from two to four feet, and that digging to the pipe is thus rendered comparatively easy.

The contrast between this and picking all the way down through frozen ground is obvious.

This device is not a speedy one, but it is safe, cheap and convenient. When it is decided to dig at a certain point the following day, it can be planned for and started the night before, and no time is lost, nor are the services of a watchman required to tend a fire; the assistance that it is on a street job in winter will be found to be most gratifying.

As no fire is used, it has the merit, moreover, of avoiding the danger of igniting any possible escaping gas from a broken main beneath, and it is cleaner than where steam is used for the purpose of thawing, turned in through a hose into a drill hole, forming mud.

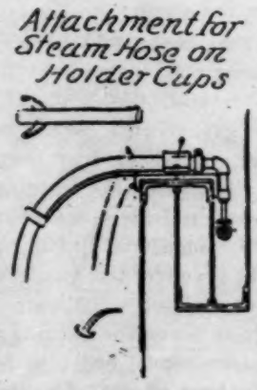
The cut illustrates the method of use.

STEAM HOSE ATTACHMENT FOR HOLDER CUPS

R. B. Brown

Steam hose on holder cups usually gives out first at the end of the nipple, as shown by the dotted lines at B.

We obviate this difficulty by the use of a support



or bracket A, which is placed under, and clamped down with the hose. As the holder rises the hose falls into the support, and following its lines cannot get kinked or bent enough to harm it.

The hose is attached to the grip by the usual clamps, D and E.

INDUSTRIAL GAS LESSONS

IF IT'S DONE WITH HEAT — YOU CAN DO IT BETTER WITH GAS

Lesson No. 54

Change of State *(continued)*

The Use of the Specific Heat Tables

The specific heat of a solid, liquid or gas has been said to be one of its most important properties. It is easy to see why this is so. Supposed it is desired to know how many B.t.u. of heat must be supplied in order to raise the temperature of a thousand pounds of iron from 60 to 1,500 degrees F. This indicates a difference of 1,440 degrees F. If one pound of water were raised that many degrees of temperature there would be consumed 1,440 B.t.u., or, if 1,440 pounds of water were raised one degree Fahrenheit, the consumption of heat would also be 1,440 B.t.u. For the specific heat of water is unity.

But iron does not possess as high a specific heat as water. Hence it will not be necessary to use as much heat to effect the temperature change of 1,440 degrees F. in one pound of iron as in one pound of water. The specific heat tables show that the specific heat of iron is 0.218. This simply means that 0.218 B.t.u. will raise one pound of iron one degree F.

The Calculation

It therefore indicates that 1,000 pounds of iron will require 218 B.t.u. to have its temperature increased one degree F., say from 60 to 61 degrees F. But the temperature change indicated in this case is 1,440 degrees F. Therefore, there will be required 1,440 times as many heat units as were required to effect a one degree rise in temperature. The total heat required will then be given by the equation:

$$1440 \times 218, \text{ or } 313{,}920 \text{ B.t.u.}$$

At the beginning of this section on specific heat the general formula for determining the amount of heat required to effect a certain temperature rise in any substance was given. This formula is:

$$H = K \times M\ (t_2 - t_1).$$

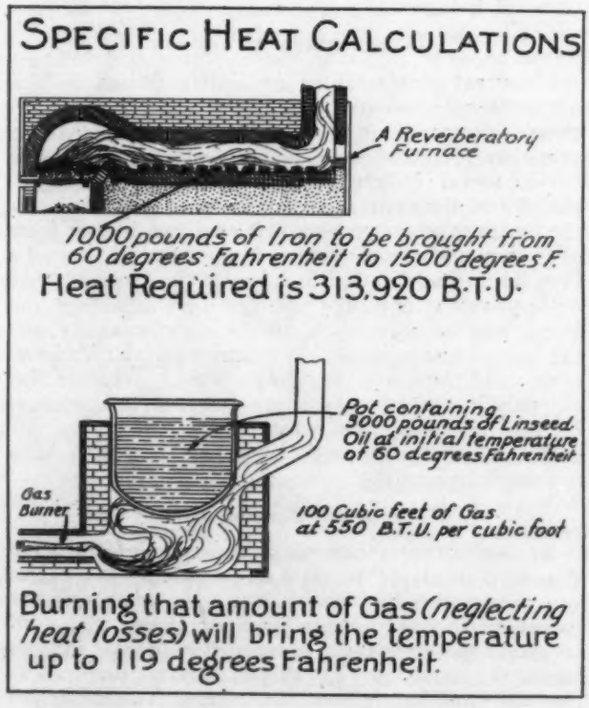
Another Example

Suppose that 100 cubic feet of gas, of 550 B.t.u. per cubic foot, are consumed in a furnace which is heating up a liquid, linseed oil. There are one and one-half tons of the liquid present. It is desired to find out how high the temperature will rise if the initial temperature was 60 degrees F.

The aforementioned equation is used in making this calculation. The mass of liquid is one and one-half tons, which must be reduced to pounds, giving 3,000 pounds. In burning 100 iubic feet of gas the heat developed is 55,000 B.t.u. The initial temperature is 60 degrees F. Substituting these figures in the equation, the following is obtained:

$$55{,}000 = K \times 3000\ (t_2 - 60).$$

From the specific heat tables, the specific heat of linseed oil is found to be 0.31. Substituting this in the above equation, the following is obtained:


SPECIFIC HEAT CALCULATIONS
A Reverberatory Furnace
1000 pounds of Iron to be brought from 60 degrees Fahrenheit to 1500 degrees F.
Heat Required is 313,920 B·T·U·
Pot containing 3000 pounds of Linseed Oil at initial temperature of 60 degrees Fahrenheit
Gas Burner
100 Cubic feet of Gas at 550 B.T.U. per cubic foot
Burning that amount of Gas (neglecting heat losses) will bring the temperature up to 119 degrees Fahrenheit.

$$55{,}000 = 0.31 \times 3000\ (t_2 - 60).$$

The equation is then solved for the value t_2, which is as follows:

$$t_2 = \frac{55{,}000 + 0.31 \times 3000 \times 60}{0.31 \times 3000}.$$

This gives a value for t_2 of 119 degrees F.

Present Trend of the Manufactured Gas Industry*

A resume of present conditions and controlling factors

F. W. Steere

GAS is a form of energy, just as electricity is a form of energy. The manufacture of gas is, in general, similar to any other manufacturing process; that is, raw material, by a series of manipulations, is put into a more usable form. The same may be said of the electrical industry, in which the energy of coal is distributed through the medium of wires. In the gas industry the energy of the coal is distributed through pipes, but during the process of converting the coal from the solid to the gaseous state many valuable by-products are recovered.

The trend of industry is affected as much, if not more, by the economic conditions surrounding it than by mechanical improvements within the industry. Occasionally, some great discovery or invention will completely revolutionize an industry overnight—but this is the exception, not the rule. Mechanical improvements usually follow rather than indicate the trend of industry.

Development to Date

The great prosperity of the United States, in fact, our present civilization, has been made possible by cheap energy. Our enormous deposits of easily available soft coal have had no small part in this development. When this country was sparsely populated and our natural resources were still abundant, the business of converting soft coal to a higher form of energy and distributing it for general use found a very limited application in a few of the largest cities. As long as our natural resources were abundant and there was no restriction on their extravagant use, the gas industry made slow progress. Now, however, conditions are changing. Our population has not only increased at an enormous rate, but, what is by far the more important consideration, the per capita consumption of energy has increased at a much greater rate.

Petroleum Consumption

By way of illustration, at the time of the Civil War two-thirds of a gallon of petroleum per capita was used annually. In the past sixty years this has increased to over 150 gallons per capita. The increase in the per capita consumption of coal follows much the same curve. While it is no doubt true that we have barely scratched the great deposits of soft coal in this country, the fact remains that great inroads have been made on the most easily accessible and richest supplies. The incentive to more efficient use of our fuels increases as the cost of the raw fuel increases. If we are to support our present grams with this gas load as the ultimate consideration. Considerable progress has already been made in the development of gas-fired boilers.

Improvements in Processes and Machinery

House heating with gas will serve as an illustration of the possibilities in the utilization of gaseous fuel. Great progress is also being made in gas-making processes and gas-making machinery. Improved coke ovens have been developed with a thermal efficiency higher than was considered possible a few years ago. A coke oven must be operated at a fairly uniform rate to obtain good economies. Some very interesting developments to increase its flexibility and adapt it to more general conditions have been brought out. For example, if the maximum yield of gas is desired and there is little demand for coke, this coke can be gasified and used for heating the ovens. If there is no demand for gas and coke is the primary product, the ovens can be fired with their own gas. If both coke and gas are required in maximum quantities, the ovens can be fired with producer gas generated from soft coal, leaving the total output of oven gas and coke for the market. These changes in the method of operation can be made very quickly and with practically no sacrifice to economy.

Carburetted Water Gas

Carburetted water gas finds its greatest field where the maximum quantity of gas is required with the lowest initial cost of plant. Water gas plants have the further advantage of being quickly put into operation, and as quickly shut down. Water gas machines were formerly very low in thermal efficiency. Improvements in design and the development of the so-called "backrun" process of operation have resulted in a much higher thermal efficiency and an appreciable increase in capacity per square foot of grate area. The accepted fuels for water gas operation have always been coke or anthracite coal. With the improvements recently developed it is now possible to use soft coal as generator fuel. This is unquestionably a great step in advance and marks a new epoch in water gas development.

Equally important improvements have been made in methods of purifying, condensing and scrubbing gas, and the recovery of by-products. Processes are being developed for the complete gasification of coal. Other processes aim to recover the maximum quantity of by-products, and in this class may be grouped all the low-temperature distillation processes. These processes are an effort to produce a smokeless fuel

(Continued on page 60)

*Presented before the Section of Gas and Fuel Chemistry at the 68th meeting of the American Chemical Society, Ithaca, N. Y., September 8 to 13, 1924.

Catechism of Central Station Gas Engineering in the United States

Installment No. 54.

(Continued from last week)

The latter is carried upon a threaded shaft, which imparts longitudinal motion to the extent of about ¼ inch for each complete revolution, and is caused to revolve by a pinion engaging with a gear wheel forming one end of the cylinder. The pinion must be made long enough to engage the wheel over the full length of travel of the cylinder. The clockwork drives it at such a rate as to produce one complete revolution of the cylinder in twelve hours and will run, with one winding, for full seven days. The pen point is carried at the upper end of an arm suspended on a pivot placed above its center of gravity so that it hangs vertically with its lower end almost touching the shaft carrying the test hand of the meter dial, and is free to swing on the pivot. On the shaft named is fixed a cam which strikes the vertical arm and pushes it to one side once during each revolution of the test hand.

The meter having been substituted for, or placed in tandem with, the regular consumer's meter in any location, a record sheet printed and ruled to show the days and hours for a week is placed upon the cylinder, and the clockwork wound up and started with the cylinder in the proper position to have the pen, furnished with a supply of ink, touch the sheet at the point corresponding to the time at which the start is made. As long as no gas passes through the meter the pen will not move and will make a straight line on the sheet, but when gas is being consumed the revolution of the test hand will cause the cam on its shaft to come into contact with the lower end of the arm carrying the pen and push it to one side so that the pen is deflected and makes a short mark on the paper at right angles to the line traced by it when at rest. Since one of these marks is made for each revolution of the test hand, each one indicates the passage of the amount of gas corresponding to one revolution of this hand (in 5-light meters this is 2 cu. ft.), and the rate at which gas is being consumed at any time is determined by multiplying the number of marks made in a given interval by the quantity represented by each one.

The charts obtained from a meter of this kind show clearly at what hours and, for each interval of time, exactly the rate at which gas passes through the meter, and makes it possible to give to the consumer information that in a great majority of cases will satisfy him of the correctness of bills about which he has complained, and also to post him as to small leakages and the consumption of gas at times and for purposes about which he knows nothing. They can also be used to determine the maximum demand of any given consumer, or, by setting one in each house along a certain piece of main, the total maximum demand on that piece. The latter information is valuable as giving data from which to calculate the size of pipe that should be used in laying a new main under similar conditions.

Section V—Chemical

Calcium Carbide and Acetylene

286. Give a brief description of calcium carbide, and of acetylene, and their properties.

Ans. Calcic carbide, or carbide of calcium, as it is popularly called, is a heavy, hard, gray crystalline substance, composed, by weight, of 40 parts of calcium and 24 parts of carbon. Its specific gravity is 2.262. It has a strong affinity for water, and when exposed to the atmosphere absorbs moisture, giving up acetylene gas. (See equation below.)

Calcic carbide is formed by the union of calcium and carbon, fused in the heat of the electric arc. The calcium is used in the form of quicklime, and the carbon as powdered coke, coal or charcoal.

0.875 lb. quicklime + 0.5625 lb. carbon = 1 lb. calcic carbide + 0.4375 lb. carbon monoxide.

$$Ca\,O + 3\,C = Ca\,C_2 + CO$$

Acetylene gas is, chemically, an unsaturated hydrocarbon of the series $Cn\ H_{2n-2}$. Its formula is $C_2 H_2$, and it is composed by weight of 24 parts carbon and 2 parts hydrogen.

It is a colorless gas. When pure it has a sweet, ethereal odor, but impurities give the commercial gas a strong, garlic-like odor. Its specific gravity is 0.91. Its weight per cubic foot is 0.07 lb. Water at 60 deg. F. will absorb about its own volume of $C_2 H_2$. It burns with a highly luminous flame. Its illuminating power is approximately 240 candles for five cubic feet.

When unmixed with other gases or with air, it must, in order to develop its full illuminating value, and prevent smoking, be burned through small, flat flame burners. It is very rich in carbon, and the flame smokes when large burners are used.

It is present in coal gas to a fraction of 1 per cent, and in a somewhat higher proportion in carburetted water gas. It is formed during the incomplete com-

bustion of illuminating gas. This occurs when the flame of a Bunsen burner "flashes back," the gas burning within the burner.

The present important source of acetylene is calcic carbide. When water is brought in contact with a calcic carbide acetylene gas and quicklime are formed, according to the following equation:

1 lb. calcic carbide + 0.5625 lb. water = 1.15625

$CaC_2 + 2H_2O =$

lb. calcic hydrate + 0.40625 lb. acetylene.

$Ca(OH)_2 + C_2H_2$

One pound of pure calcic carbide produces 0.406 lb., or 5.8 cubic feet acetylene.

Acetylene burns to water vapor and carbon dioxide.

Combustion and Oxidation

287. What is oxidation? What is combustion?

Ans. "Chemically considered, oxidation and combustion are identical, being in each case the combination of oxygen with another element or elements.

"When the union with oxygen takes place rapidly with the production of light and heat, the process is called 'combustion.' This is seen in the burning of coal or wood.

"On the other hand, 'oxidation' is accomplished slowly and gradually, and usually without any perceptible increase in temperature, as in the rusting of iron."

Combustion may be scientifically defined as a union of any two or more elements with evolution of light and heat, but in general the word is defined as above.

Atomic Weight

288. What is meant by the atomic or combining weight of a substance? What use is made of this weight?

Ans. The atomic or combining weight of a substance is the ratio between the weight of an atom of the substance and that of an atom of hydrogen, the weight of the hydrogen atom being taken as unity, since it is the lightest of all known atoms. The atomic weights of the various elements do not, therefore, represent any absolute weights, but merely the number of times that the atoms of the respective elements are heavier than the atom of hydrogen.

Atomic weights are useful in calculating the proportionate weights in which various substances enter into combination with each other, or into any chemical reaction. Since all chemical compounds are formed by the combination of atoms or multiples of atoms of the various elements, the weights of the different elements in any compound must always be proportionate to their atomic weights, and therefore knowing the atomic or proportionate weights of the atoms of the various elements in any compound, the proportionate weights of each of the elements contained in the compound, and of the compound itself, can be determined as soon as the formula of the compound, that is, the number of atoms of each element contained in it, is known. The same thing is true of the molecular weights of compound substances, since such substances always enter into chemical reactions in weights proportional to their molecular weights.

Use of Atomic Weights

As an instance of the use of atomic weights, the formation of carbon dioxide, CO_2, may be taken. This gas is formed in the combustion of carbon, C, by the union of carbon and oxygen, O. The equation of the reaction between the two substances is $C + O_2 = CO_2$, that is, one molecule of carbon, consisting of one atom, unites with one molecule of oxygen, consisting of two atoms, to form one molecule of carbon dioxide, consisting of one atom of carbon and two of oxygen. The atomic weight of carbon is 12 and that of oxygen 16, so the proportion by weight in which they unite is 12 of carbon to 32 of oxygen. That is, 12 lb. of carbon unite with 32 lb. of oxygen to form 44 lb. of carbon dioxide, and, whatever the weight of carbon, the weight of oxygen required for its combustion and the weight of carbon dioxide produced can be easily found from the above proportions.

In the same way the proportional weights in which any substances enter into chemical combination are determined from their atomic or molecular weights.

Molecular Weights of Elements

289. The atomic weights of various elements are as follows:

Hydrogen, H	1
Oxygen, O	16
Sulphur, S	32
Carbon, C	12
Nitrogen, N	14
Iron, Fe	56
Calcium, Ca	40

Give the molecular weights and the proportion by weight in which the various elements are contained in the following substances:

Carbon Monoxide	CO
Ammonia	NH_3
Sulphuric Acid	H_2SO_4
Calcic Hydrate or Slaked Lime	$Ca(OH)_2$
Sulphuretted Hydrogen	H_2S
Sulphate of Ammonia	$(NH_4)_2SO_4$
Ferric Hydrate, or Hydrated Sesquioxide of Iron	$FE_2O_3.H_2O$

Ans. Each molecule of carbon monoxide, CO, contains one atom of carbon, C, and one of oxygen, O, and its weight is equal to the sum of the weights of these two atoms. Therefore, its molecular weight is equal to the sum of the atomic weights of carbon, C, and oxygen, O, or to $16 + 12 = 28$. This shows that 16 lb. of oxygen, O, unite with 12 lb. of carbon, C, to form 28 lb. of carbon monoxide, CO, or, putting it in another way, that carbon monoxide.

(Fifth Installment Next Week)

PROSPEROUS 1925

(Continued from page 52)

Deductions

Only two deductions can be made from this state of affairs.

Either the nation has bought less during the year 1924 than its normal volume of consumption.

Or the nation has lived from its reserve of unsold merchandise.

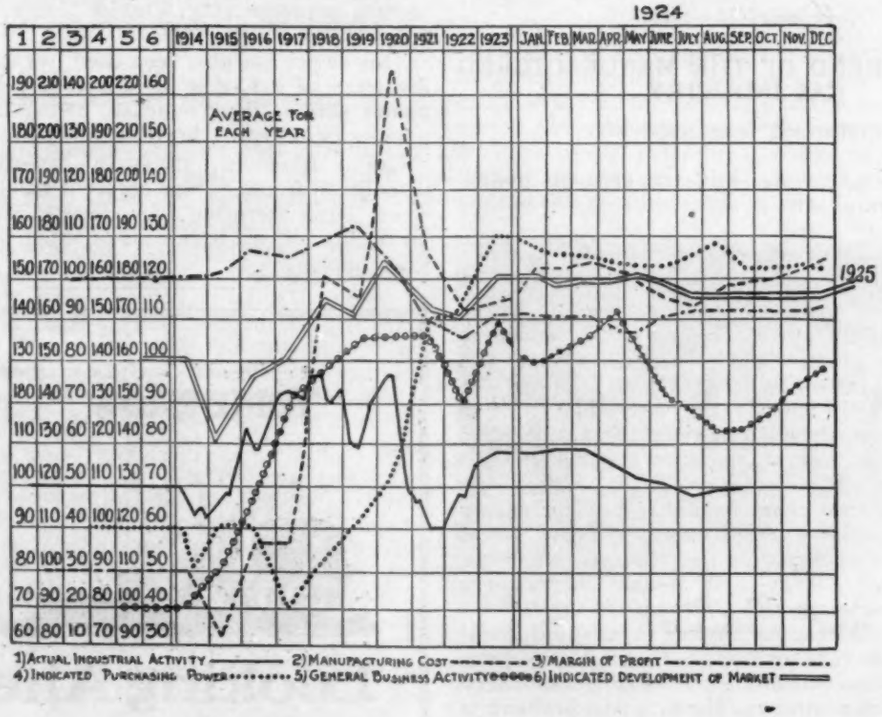
Both conclusions may require some qualification. There is no doubt of the decline of the actual volume of consumption. This decline, however, cannot be so very extensive if one considers the natural increase in the number of consumers, represented by the permanent growth of the population of the United States.

This, in turn, lends weight to the contention that the market has made more use of reserve stocks during the past year than usual. Support is given to this argument by the policy of "clear stocks before ordering," which has been noticed in almost all the retail trading branches of the nation's market. Manufacturing, wholesale and retail trading associations have repeatedly pointed to this tendency among their consumers.

Using Reserve Stocks

We are meeting here in a somewhat lesser form the same condition which we experienced during the war, when the nation's industrial activities were centered upon the production of war material. Now, as then, the reserve stocks of peace merchandise have become depleted, leading to an immense demand for such goods after the conclusion of the armistice. We shall not see an industrial revival of similar strength during the coming year. But it is evident that the nation cannot continue to do business much longer upon the present basis. It will have to turn back soon to a more rational system of merchandising, with shelves well filled for an emergency. This it will do as soon as the retailer finds sufficient encouragement from the consumer.

The consumer's position all through last year has been difficult to define. He has not been a free spender in the so-called consumers' goods, but he has again added largely to his investments by buying life insurance, dwellings and bonds. The savings banks have done much business with him. But he has stayed away from the shops. Is it that prices were not attractive enough, or has the consumer taken a fright? Whatever the reason is for his attitude, it seems almost impossible that he should continue much longer upon the same path.



These two factors, the depletion of retail stocks and the inevitable increase of purchases by the consumer, are the outstanding features of the present situation. Acting together, they must produce over short or long a revival in ordering from the retail centers. But there is still some doubt about the actual date of this revival of trade.

More Improvement to Follow

Business men may be inclined to be satisfied already with the little improvement we have had so

far. But we are entitled to more. We should advance at least 10 per cent ahead of present figures, which would still mean just taking care of the current demand.

Any new buying movement, however, needs money. Not the existence of a money reserve accumulated in the banks, but new money earned by the wage earner. These new earnings will not materialize during the next few weeks. Their advent will be deferred most likely to the early days of spring. The spring business, in consequence, promises to be a good one, and it is the eventuality of a revival of trade upon a large basis during March and April which the American business man will have to consider in laying his plans for 1925.

PRESENT TREND OF THE MANUFACTURED GAS INDUSTRY

(Continued from page 56)

from soft coal and convert the condensable hydrocarbons to motor fuel.

Oil Gas

Just as great activity is also apparent in the oil gas field. Some of the processes aim at complete gasification, others produce gas for distribution and benzol for motor fuel as a by-product.

The gas industry has never seen the time when so much effort was expended in attempting to develop new processes and improve existing apparatus. This activity is further evidence of the changing conditions being brought about by the rapidly increasing rate of the consumption of energy. There is no doubt but that we have reached the time when the conservation of energy will assume increasingly greater importance.

In the final analysis, the answer to most industrial problems is the economic answer, not the mechanical. There is no difficulty in developing machinery that will conserve energy. The practical problem is to develop machinery and processes that will save energy and money at the same time. As society is now organized, the trend of every industry is primarily towards conservation. The best evidence that we are entering a Gas Age is that higher efficiencies and bigger dividends are beginning to lie in the same direction.

FINDING GAS LEAKS BY RADIO

The tearing up of roadways and sidewalks in an attempt to locate leaking gas mains will soon be almost a thing of the past as the result of a new invention which applies the principles of the radio to this work.

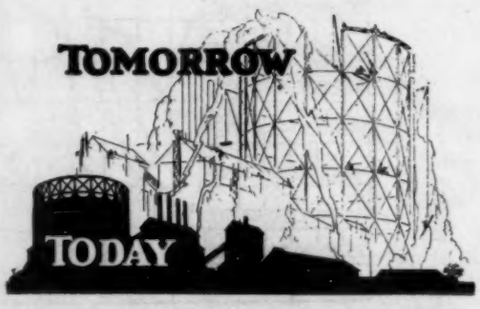
The attempt to find old underground piping in sections of the city which have undergone radical changes frequently results in digging up much of the surrounding property and is a cause of serious inconvenience to traffic and property owners. Thanks to the radio, this has now become an exact science.

Mains and pipes are found by what may be called an electric divining rod. Lines of force produce a current of electricity in a coil of wire through which they pass. Lines passing upward through the coil will cause a current in one direction. Those going downward will set up a current in reverse direction. If the current in the original conductor is interrupted, the current in the coil will be similarly interrupted.

If the current is given free play it will produce a buzzing sound in the receiver. As the operator approaches near to a pipe the buzzing sound in the phones becomes very intense. Once directly over the pipe the sound stops entirely.

This device has also been used to catch stealers or diverters of gas, who have caused many gas companies serious inconvenience, owing largely to the popularity of home brewing and bootlegging.

Gas is frequently stolen by diverting the gas through an auxiliary pipe before it reaches the meter. These pipes are often very cleverly hidden, but can be readily located by means of the detector coil and head phones.



Looking Ahead

TODAY we are planning for the increased use of gas service in 1930. We are even looking ahead as far as 1935 and 1940.

Why is this necessary?

Because our business never stands still. The demand for gas service constantly increases and we must prepare years in advance to keep step with your fuel requirements.

"If it's done with Heat—you can do it Better with GAS"

The test of good public service is its ability to meet demands instantly and satisfactorily. The gas used to cook tonight's dinner, to heat the bath water and keep your home comfortable, was planned for away back in 1920.

(Your Name and Address Here)

A Gas Advertisement Symbolizing Progress

THE FUEL OF THE FUTURE—WHAT SHALL IT BE?

(Continued from page 46)

through the annealing process. Thus in the first place the purpose of annealing the steel may be to soften it so that it is put in a condition to be machined. Then, again, another and perhaps more familiar purpose of the annealing process is to relieve stresses and strains that may have been induced in the steel during the process of hardening or during the various other mechanical treatments to which it has been put in course of manufacture. Finally, the annealing of the steel product may be carried out for the express purpose of refining the grain and at the same time secure great ductility.

The essential steps in the annealing process is to heat the metal to a certain predetermined temperature and then to cool the same down again at a moderate rate of speed.

Fundamental Elements of Annealing

There are four fundamental elements of annealing from the strictly theoretical basis. First, there is the rate of heating, then the temperature of the metal at the final point in the heating process, as well as throughout the heating process, then the length of the heating process, and finally the rate at which the metal is cooled down. However, in reality, there is much more to the annealing process than just the observance of these four conditions. A certain amount of skill is required of the operator in the application of these simple principles, and if this is not forthcoming, then the results will not be satisfactory, even though conditions seem to have been observed as closely as possible.

In the application of heat to the metal in the furnace, the manner in which the metal is located is of importance. It is absolutely necessary to get the heat to penetrate into the interior of the metal just as quickly as possible, so that the annealing will be uniform throughout, and, furthermore, so as to shorten the time of absorption of heat and lessen the time of exposure of the top and outside edges of the metal to the action of the furnace atmosphere and the heat.

It is necessary for the heat to circulate through the furnace. This is an important point, and the gas engineer should bear it in mind in attempting to design a furnace in which steel products are to be annealed.

Preheating the Metal

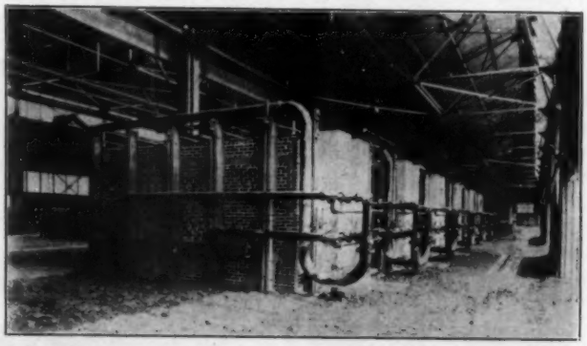
The necessity for preheating steel articles, particularly those that are made in intricate designs, is of considerable significance, for if the article is introduced into the hot furnace the metal will be subjected to strains which will tend to warp it and distort its shape. This gives the gas engineer an opportunity of using the waste heat in the blue gases in a preheating furnace. In this way a certain amount of this waste heat is saved after the flue gases have been passed through the heat recuperators which, for reasons of economy, must be used in conjunction with the gas-fired heat-treating furnace.

Effect of Heating on the Structure of the Metal

The effect of heating on the structure of the metal is a matter that requires considerable study for adequate understanding, and as this lies entirely in the province of the metallurgist it will not be discussed here. Suffice it to say that the heating has a profound effect on the metal structure. There is a rearrangement of particles of the metal, relief of strains and stresses and a general enhancing of the internal condition, so that the metal is enabled to meet more severe claims put upon it.

Rate of Heating

The rate of heating is as important as the method of heat application. The rate must be such that the metal is heated up uniformly to the proper temperature. The temperature of the interior of a large mass of metal under heat treatment is lower than that of the outside. The only way in which to get around this condition and still not injure the product



A Battery of Annealing Furnaces Fired with Gas

is to prolong the heat treatment. Here it will be seen that the rate of flame propagation of gaseous fuel is of decided advantage and it is recommended that the gas used be such that this rate of flame propagation be as high as possible.

Temperature of the Heating

The temperature at which annealing is carried out is dependent on the percentage of carbon in the steel. The object of the heating is, in fine, to produce a new crystalline structure in the metal, the particles of which shall be the smallest attainable. The following tabulation gives various temperatures of annealing:

Range of carbon content	Range of annealing temperature
less than 0.12%	
0.12 to 0.29	1607 to 1697 deg. F.
0.30 to 0.49	1499 to 1544 deg. F.
0.50 to 1.00	1454 to 1499 deg. F.

In figuring the amount of gas that is required for the annealing operation, these temperatures must be taken into consideration

Duration of Heating

The time that is consumed in the annealing operation will depend upon how long it takes to heat the metallic mass up to the required temperature. This means the entire mass of metal. Naturally the length of the heating will depend to a large degree on the size of the metallic mass that is being processed. After the proper grain structure has been attained in the steel by the annealing process and all the internal stresses and strains have been relieved, the rate of cooling should be chosen in such a manner that these effects are not negated. The rate of cooling has a very great influence on the structural characteristics of the metal.

Box Annealing

In this method of annealing the articles are placed in an iron box and are packed with ground mica, sand, charcoal, charred bone or leather, lime, etc. The object of box annealing is to protect the metal against the decarburizing action which can take place in the annealing furnace. Decarburizing is simply

A Heat Treating Room with Complete Equipment for All Operations

the action of the oxygen, which leaks into the furnace, of burning out the carbon that is contained in the metal. It sometimes happens in the annealing process that the carbon in the metal is burnt out for a considerable depth below the surface. Furthermore, the oxidizing effect of the oxygen in the atmosphere of the furnace will cause the formation of a scale on the metal which is deleterious to the quality of the product manufactured.

Gas Insures a Reducing Atmosphere

It is thus evident that the maintenance of an atmosphere within the furnace which is reducing is of considerable importance. The pressure of oxygen in the atmosphere of the furnace may, of course, be due to the fuel used. In this respect gas possesses a distinct advantage over all other types of fuel in that a reducing atmosphere can be maintained within the furnace. But sometimes, no matter what type of fuel is employed, oxygen will be found in the furnace atmosphere. This is due to poor construction of the furnace, which permits air to leak into the treating chamber. Of course, the metal may be protected, as has been indicated above, during the annealing process, but it is far more satisfactory to use a fuel like gas, whose combustion may be accurately controlled, and to conduct the heating operations in a properly constructed furnace.

It may be mentioned at this point that the atmosphere in the furnace, while of considerable importance in the case of annealing steel articles, may be of even greater importance in heat-treating articles made of other materials, such as brass. In this case the article will undergo change in color, due to the oxidizing action of oxygen in the furnace atmosphere.

Gas Offers Economy

However, when the proper fuel is used, and gas is superior for this purpose because of the ease with which its combustion can be regulated and the proper atmospheric conditions maintained within the furnaces, and when the furnace is properly constructed so that no air can leak into it, which can be done, then it is found that the annealing process can be conducted without the necessity of protecting the surface of the metal against oxidation. This unquestionably entails expense and cuts down the output of the furnace. Those heat treaters who abide by this practice and persist in using an inferior fuel should be made to see the real advantage of gas, which, even though a more expensive fuel, will allow them to do away with the use of boxes and other protective materials.

Thus it might well be that the use of the more expensive gaseous fuel will not entail any additional expense to the manufacturer and may even enable him to effect economies which will more than counterbalance the extra charges for the gaseous fuel.

The gas engineer must understand these facts and have a working knowledge of the conditions surrounding the annealing process in order for him to be able to attack his problem in the proper manner and secure the desired results. The proper understanding of the importance of the atmospheric conditions within the annealing furnace and of the real economy that is attained by the use of a more expensive fuel, which will safeguard the articles that are being annealed, by the elimination of the use of protective materials and boxes, is of paramount significance in this case. And it is so with the other heat-treating operations. Each possesses its own peculiarities and definite conditions under which it must be carried out. It is absolutely essential to observe these conditions and the gas engineer who is concerned with the sale of gas for industrial purposes must understand how his fuel can meet the requirements, and, in fact, produce better results than other fuels, even though these requirements are most severe, before he can hope to sell his prospect.

SELLING HEAVY DUTY HOTEL APPLIANCES

(Continued from page 50)

Recently some of the best gas installations we have were considering going back to coal or putting in oil burners, and in some cases are figuring on enlarging their electrical equipment so that electrical appliances could be used.

"Those talking about using electrical equipment are those who have their own electrical plant and generate their own current. The heavy duty electrical equipment, although some is being sold, does not give the satisfactory results that gas does, and the chefs prefer gas in the large majority of cases for the reason that they are more used to it and like to see the actual fire, which is not possible with electrical equipment.

Gas vs. Oil

Along the Pacific Coast and in a few other parts of the country there have been some installations made where oil burners have been used, and apparently they were satisfactory as to cost of operating. However, from reports received, which have not been checked, there is a complaint that, after a while, the oven absorbs the oil fumes, which has a tendency to taint the food being cooked, as well as causing a very disagreeable odor in the kitchen.

Selling Field

The field for selling heavy duty hotel and restaurant appliances would include hotels, restaurants, lunch rooms, tea rooms, delicatessen stores, retail bakers, clubs, prisons, schools, colleges, hospitals, manufacturing plants, insurance companies, banks, lodges, city, county and state institutions, army and navy barracks, large residences, etc.

To secure the business where heavy duty appliances are required it cannot be a hit and miss proposition, but has to be worked out in a systematic manner. There should be lists of cards covering the entire field, and these prospects should be called upon either four or five times a year, until they are eventually sold. Even after the first installation is made, they still should be called upon to see if there is not additional equipment required, and to see if their equipment is in proper working order.

The salesman who calls on these prospects should be fully informed as to the working of the appliance, so that he is able to explain all details to clients in his selling talk or to the one who is to operate the appliance. He should also know whether or not the burners on the appliances are properly adjusted and burning the required amount of gas for work to be done.

Displays

It has been found that the gas company or equipment house that has a proper display of heavy duty appliances connected with gas that can be demonstrated to a prospective buyer is more successful in getting business of this kind than those who try to sell entirely from a catalogue or photographs. In fact, the actual showing of the appliances in operation will close a sale quicker in almost every case, and more is accomplished in one showing of the appliances in operation than making a dozen calls on the prospect. Those who have a display are proving the value of it daily.

Industrial Kitchens

There is a class of business which has been developed in the past few years which has proven to be a valuable gas load, namely, industrial kitchens in such places as factories, department stores, insurance companies and banks. Many of these have put in elaborate restaurant equipment for feeding their employees. In some cases the meals are served without cost to the employee and in others at a nominal sum, which barely covers the cost of the food. In most instances the company have to make up a deficit at the end of the year, which they are very glad to do, as they have found it profitable.

The idea of establishments of this kind putting in equipment to feed employees works well for all concerned. In the case of the employees, they are able to get good food gratis, or at a nominal cost, in pleasant surroundings. On the other hand, the employer limits the lunch hour to a shorter period, say three-quarters of an hour, instead of an hour. If there are a few hundred or thousand employees, and fifteen minutes is saved on each employee it gives more actual working time in the office per day, and in a year's time would add many days of actual working time.

Don't Oversell the Prospect

Considerable attention should be given in recommending the proper appliances for the class of work to be done, and it is advisable not to oversell the prospect. There are instances where five ranges have been sold where three, with spreader plates between, worked to full capacity, would have cooked just as much food at a very much lower fuel cost per meal. In the average kitchen, if the five ranges had been installed, the cooks would run all five ranges, whether they had need of them or not, whereas, if they had only the three sections, they would manage with them to do all their work. This, of course, does not apply to all cases, but to a big majority.

Service and Advantages of Gas

In most cases the cost of fuel is a secondary consideration and more stress should be laid on the service and advantages of gas over other fuels.

It is the constant following up of prospects in a systematic manner which secures the business.

In being called into many sections of the country to co-operate with gas companies and kitchen equipment dealers in promoting the sale of heavy duty gas equipment, I have had an opportunity to observe the efforts and methods pursued by many concerns in working for sales of this character, and will frankly and truthfully say in every case I have encountered, where the dealer made the right sort of effort, the customers were responsive and a fair share of business was received. However, I am sorry to say I have found very few companies who have had any organized plan of campaigning for the sale of heavy duty equipment. This is surely regrettable.

Current Market Prices

COALS (By Courtesy of Coal Age)

A. Bituminous.

(Spot prices, F. O. B., mines, net tons).

High Volatile, Eastern	Market	Price
Pool 54-64 (Gas Standard)	New York	$1.40 to $1.65
Pittsburgh screened gas	Pittsburgh	2.30 to 2.50
Pittsburgh gas, mine run	Pittsburgh	2.00 to 2.25
Kanawha lump	Columbus	2.25 to 2.75
Kanawha mine run	Columbus	1.50 to 1.75
West Virginia lump	Cincinnati	1.90 to 2.75
W. Virginia gas mine run	Cincinnati	1.25 to 1.40
Midwest		
Indiana 4th vein lump	Chicago	3.50
Indiana 4th vein mine run	Chicago	2.25 to 2.50
South and Southwest		
Big Seam lump	Birmingham	2.50 to 3.25
Big Seam mine run	Birmingham	1.50 to 1.90
Southeast Kentucky lump	Louisville	2.75 to 3.25
Southeast Kentucky mine run	Louisville	1.25 to 1.75

B. Anthracite.

(Spot prices F. O. B. mines, gross tons),

Market	Freight rates	Independent	Company
Egg New York	$2.34	$8.50 to $8.75	$8.75 to $9.25
Egg Philadelphia	2.39	9.45 to 9.75	8.80 to 9.25
Egg Chicago (net tons)	5.06	8.17 to 8.40	8.08

COKE (By Courtesy of Iron Trade Review).

Connellsville, furnace	$4.25 to $6.00
Wise County, furnace	4.00 to 4.25
Alabama, furnace	4.00 to 4.50
Foundry, Newark, N. J., del	10.41
Foundry, Chicago, ovens	10.75
Foundry, Boston, delivered	11.50
Foundry, St. Louis	11.00
Foundry, Granite City, Ill	9.00
Foundry, Alabama	4.56 to 5.25

PETROLEUM (By Courtesy of Oil, Paint & Drug Reporter)

(Prices at wells, per bbl.)

Pennsylvania—Ohio—West Virginia.	
Cabell, West Virginia	1.45
Corning, Ohio	1.50
Lima	1.58
Pennsylvania	$3.00 to 3.10
Wooster, Ohio	1.40
Indiana—Illinois.	
Illinois	1.37
Indiana	1.38
Oklahoma—Kansas.	
Mid-continent (low gravity)	.75

Gulf Coast.

Gulf Coast, Grade A	$1.50
Gulf Coast, Grade B	1.25

GAS OILS.

Gas Oil, Bayonne, bulk gal	5¼c
Gas Oil (32-36) Oklahoma, gal	3½ to 3¾c
Gas Oil (32-36) Gulf Coast, gal	3¾ to 4 c

PIPE AND FITTINGS—CAST IRON GAS PIPE.

(By Courtesy Iron Trade Review.)

Four-inch, Chicago	$57.20 to $58.20
Six-inch and over, Chicago	53.20 to 54.20
Four-inch, Birmingham	49.00 to 49.50
Six-inch and over, Birmingham	45.00 to 45.50
Four-inch, New York	65.50 to 66.50
Six-inch and over, New York	60.50 to 61.50
Standard fittings, Birmingham, base	115.00

6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20.

BY-PRODUCTS

(By Courtesy of Oil, Paint and Drug

Ammonia aqua, 16 deg. drums lb	5 to 5¼c
Ammonia aqua, 20 deg. drums lb	6¼ to 6½c
Ammonia aqua, 26 deg. drums lb	6½ to 7 c
Ammonia squa, anhydrous cylinder, lb	30 to 36 c
Ammonium sulphate, bulk F. O B. Works, per 100 lbs	$2.75 to $2.80
Potash prussiate, yellow casks, lb	18 to 19c
Potash prussiate, red casks, lb	38 to 39c
Soda prussiate, yellow casks,	9¾ to 10c
Soda sulphocyanide, barrels, lb	45 to 55 c

COAL TAR BASIC PRODUCTS.

(By Courtesy of Oil, Paint and Drug Reporter)

Benzol C. P. tanks, works, gal	24 to 25c
Benzol, drums, gal	30c
Benzol, 90% tanks, works, gal	23c
Benzol, 90% drums, gal	28c
Napthalene, flake, barrels, lb	5½ to 6 c
Napthalene, dyestuff bags, lb	5 to 5½c
Solvent Naphtha, water white works, gal.	24 to 25c
Solvent Naphtha, drums, works, gal	29 to 30c
Toluene, C. P. tanks, works, gal	31c
Toluene C. P. drums, works, gal	36c

Coal

Production of bituminous coal during the week ended January 3, according to the Geological Survey, totaled 10,591,000 net tons, an increase over the previous week of 2,953,000 net tons, or nearly 39 per cent. As New Year's Day was almost universally observed as a holiday, the average output per working day was about 2,000,000 tons. Production in the corresponding week of 1924 was 9,368,000 tons and in 1923, 11,371,000 tons. Anthracite output during the week ended January 3 aggregated 1,255,000 net tons, an increase of 226,000 tons over that of the previous week, but 181,000 tons less than was produced in the corresponding week a year ago. Failure to settle the outlaw strike in the northern field is holding down production to a considerable extent.

NEWS OF THE GAS INDUSTRY

Gas Sales Association of New England

Selling Heavy Duty Hotel Appliances Discussed—Sales Quota Established

(By Special Correspondent)

The first meeting of the Gas Sales Association of New England for the year 1925 was held at the Boston City Club, on Friday, January 9. On account of the absence of Governor Quinn, of the association, the meeting was presided over by past Governor Gould. One hundred and sixty-one members were present.

As Mr. Gould was the first governor of the association, he took a few minutes to review the work the association has done. He stated that it was eight years ago when the first meeting was held, with twenty-four members present and on the original board of managers every member was present at the meeting with but one exception. Mr. Gould brought out the point that this was a good example of staying qualities that the newest members of the association could well adopt.

Moving Picture Story of Gas

Mr. Bauer, of the Worcester Gas Light Company, addressed the meeting in an endeavor to interest the men in a moving picture film on the story of gas. Mr. Bauer stated that booklets had been published on this subject, but this method cannot show the people actual conditions.

The idea of the film would be to start at the coal mines and show how coal is mined, how it is taken to the plant, what is done with the coal when it arrives at the gas plant and take in the actual operation at the plant. Also picture the distribution system and what is necessary to give the customers 24-hour service.

This film could be shown at local clubs, meetings of customers, etc. It is felt that there is a great need for such a film. Anyone having ideas or suggestions, please communicate with Mr. Bauer at the Worcester Gas Light Company or the Worcester Film Company at Worcester.

The Co-ordination Committee, with Mr. M. B. Webber chairman, presented their report covering the consolidation of all the gas associations in New England into one association. This matter was referred to the board of managers for recommendations.

The speaker of the evening was Mr. C. H. French, manager of the hotel department of the Standard Gas Equipment Corporation of New York. Mr. French took for his subject the matter of selling heavy duty hotel appliances. (This article is published elsewhere in this issue of the American Gas Journal.)

Gas Sales Quota

A gas sales quota was unanimously adopted at this meeting.

This quota was formulated after several months of study by a Sales Quota Committee from the Gas Sales Association under the leadership of G. E. Stephen, of the Worcester Gas Light Company, as chairman, in co-operation with committees from the New England Gas Engineers Association and the New England Association of Commercial Gas Managers.

The first effort of this committee was to send out to the gas companies of New England, asking them for their 1923 range and tank water heater sales and from which appeal 65 definite answers were received.

These figures, together with the number of meters installed in these different companies, were carefully analyzed by the committee, and percentages figured, and the differences found were amazing.

In making a careful investigation of these particular instances in a large measure, the committee was able to locate why these differences existed and also found that there was a great difference between the number of ranges and tank water heaters sold.

In some companies the committee found a very good percentage of ranges were sold, but these same companies showed a very poor percentage in tank water heater sales. This seems to be the rule, rather than the exception, and the committee find that the efforts in the sale of tank water heaters has been woefully neglected.

It was found that some companies had sold over 7 per cent of their meters in ranges and less than 1 per cent of their meters in tank water heaters. Another company showed in its sale of tank water heaters nearly 7 per cent and in the sale of ranges only 4 per cent.

Another example. It was found range sales in one company, which was the lowest, amounted to about 1 per cent, and the highest company was over 8 per cent. In tank water heaters the lowest company was about ¾ of 1 per cent and the highest was nearly 7 per cent so the committee feels that there should be a standard or quota set to strive for.

Some of the larger companies are selling more than the smaller companies and vice versa for seemingly no good reason except the enthusiastic effort put behind sales campaigns during the year.

The Classification

The committee considered it wise to group the companies in separate classes as follows:

A Class—Companies of meters from 5,000 or less.

B Class—Companies of meters from 5,000 to 25,000.

C Class—Companies of meters from 25,000 to 50,000.

D Class—Companies of meters from 50,000 or over.

While the figures that are recommended as quotas for 1925 may appear either too large or too small, the committee wishes to impress this fact, that guesswork has been entirely eliminated, in arriving at these figures, and these deductions are based on information which the committee received from 65 representative gas companies in New England.

Therefore, the committee recommends that the gas companies together with gas appliance manufacturers, strive to sell during the coming year the following quotas for ranges and tank water heaters:

The Quota

	Ranges	Tank Water Heaters
Companies of meters from 5,000 or less..	5 %	4 %
Companies of meters from 5,000 to 25,000	4½%	3½%
Companies of meters from 25,000 to 50,000	4 %	3 %
Companies of meters from 50,000 or over	3½%	2½%

In conclusion, the committee stated that companies who have in the past used quota in ranges and tank water heaters have found it a wonderful help in increasing interest and enthusiasm in sales efforts and have increased to a considerable percentage the sales in these two appliances.

New Jersey Gas Association to Hold Mid-Year Meeting on January 23

The program is as follows:

Morning Session

10 a. m.—Meeting called to order and opening remarks by the president, Raymond W. Lee.

10:30 a. m.—Address of Welcome, P. S. Young, vice-president Public Service Corporation of New Jersey.

11 a. m.—Paper, "Keeping Ahead of the Demand in Distribution," F. A. Lydecker, assistant general superintendent of distribution, Public Service Electric and Gas Company. Discussion.

11:30 a. m.—Paper, "Selling More Gas in Home Laundries," Howard M. Bennett, sales manager, W. E. Lamneck Company, Columbus, Ohio. Discussion.

12 a. m. to 1 p. m.—The Public Service Electric and Gas Company invites the members and their guests to a Novelty Luncheon under direction of Miss A. B. Swann, chairman, Home Service Committee, American Gas Association.

(Afternoon Session)

1 p. m.—Paper, "The Economies of Merchandising," Alfred P. Post, comptroller, American Gas Company. Discussion.

2 p. m.—Paper, "The Industrial Gas Era," William M. Hepburn, vice-president, Surface Combustion Company, New York City. Discussion.

2:45 p. m.—Paper, "Why Closer Co-operation Between Gas Company and Appliance Manufacturer Is Necessary," Harry Schall, vice-president, Standard Gas Equipment Corporation. Discussion.

3:15 p. m.—National Sales Plan of American Gas Association, Robert Canniff, chairman, Sales Stimulation Committee, American Gas Association.

Advertisers to Aid Customer Ownership of Public Utilities

Detroit, Mich.—Protection for the customer ownership plan, now so generally employed by American public utilities, from the efforts of deceptive and fraudulent stock promoters to induce the customer-owner to exchange his stock for theirs, will be among topics discussed by the executive committee of the Associated Advertising Clubs of the World, meeting here January 28.

This announcement was made here today by Lou E. Holland, president of the Advertising Clubs.

With the formal co-operation extended recently by four great associations of public utility companies—the National Electric Light Association, American Gas Association, American Electric Railway Association and Empire State Gas and Electric Association—the National Vigilance Committee of the Associated Advertising Clubs and affiliated Better Business Bureaus, Mr. Holland said, are planning to extend their efforts against this type of advertising deception.

The executive committee will also plan extensive work to protect the public from deceptions in the radio field.

Chairmen of various committees in charge of the 21st annual convention of the Associated Advertising Clubs, in Houston, Texas, May 9-14, will also attend this meeting.

Gas Men Appointed on Committees of Public Utilities Advertising Association

Among the gas men who were recently appointed on committees of the Public Utilities Advertising Association are Robert Livingston of the Consolidated Gas Company of New York (membership); Edward J. Cooney, Lowell Gas Light Company, Lowell, Mass. (chairman, exhibits); H. M. Lytle, Illinois Committee on Public Utility (exhibits); W. F. O'Donnell, United Gas Improvement Company; J. C. Jordan, Pacific Gas and Electric Company, 445 Sutter street, San Francisco, Calif.

The Committee on Association Bulletin included Charles W. Person, secretary advertising section, American Gas Association, New York.

The Committee on Costs and Results included E. Paul Young, chairman, Illinois Power and Light Corporation, Chicago, Ill.; John G. Learned, Public Service Company of Northern Illinois; R. H. Timmons, Kansas Gas and Electric Company, Wichita, Kan.; that on Better Copy, S. G. Crake, American Gas Journal, 53 Park place, New York; that on Employment Bureau, James M. Bennett, United Gas Improvement Company, Philadelphia, Pa.; George A. Davis, Oklahoma Gas and Electric Company, Oklahoma City, Okla.; Robert Canniff, Central Hudson Gas and Electric Company, Poughkeepsie, N. Y.; John F. Weedon, Peoples Gas Light and Coke Company, 122 S. Michigan avenue, Chicago, Ill.; that on Speakers, B. J. Mullaney, chairman, Peoples Gas Light and Coke Company, Chicago, Ill.; W. S. Vivian, Middle West Utilities Company, Chicago, Ill.; T. L. Scott, Los Angeles Gas and

Electric Corporation, Los Angeles, Cal.; and that on Program, Frank L. Blanchard, chairman, Henry L. Doherty & Co., New York; Joe Carmichael, director of Iowa Committee on Public Utility Information, Des Moines, Iowa; B. J. Mullaney, Peoples Gas Light and Coke Company, Chicago, Ill.

Customer Ownership in No. Ind. Gas & Electric Co.

Hammond, Ind.—The growth and popularity of customer-ownership of public utility securities is evidenced by the announcement that stockholders in the Northern Indiana Gas and Electric Company now number nearly 10,000.

The regular quarterly dividend checks are being received today by 9,948 customers, employees and other investors in the preferred stock of the company, according to an announcement made at the general office of the company here.

This represents the actual number of paid-up stockholders in the company at the close of business on December 31. In addition, it was announced that 3,844 investors are buying the preferred stock on the monthly savings plan, making a total of 13,792 persons, who either are paid-up or prospective stockholders.

Sale of the company's 7 per cent preferred stock began late in the summer of 1923, soon after management of the company was assumed by Samuel Insull and associates. The first quarterly dividend on this stock was paid on October 13, 1923, to 394 stockholders. One year later, the fifth regular quarterly dividend was paid on October 14, 1924, to 8,677 stockholders. This represented an increase of 2,102 per cent in twelve months.

The number of stockholders today represents an increase of 2,425 per cent in fifteen months. This is regarded by officials of the company as an unusual record of a rapid increase in the number of stockholders and a demonstration of the success of the customer-employee ownership movement.

Gas in Los Angeles

(F. P. Sampson)

Los Angeles, Calif.—There is more fuel gas used by the inhabitants of Los Angeles and immediate vicinity than is used by the same number of people in any other part of the world.

Ninety-five per cent of all the restaurants, hotels, clubs and cafeterias in Los Angeles use gas as a fuel in their kitchens for preparing the food that is served on their tables and counters. Whether you dine at a hotel de luxe or sit on a stool at the cheapest lunch counter, you may be quite sure when you eat in Los Angeles that the food you are consuming has been cooked by means of a gas stove of some description.

A large percentage of the hotels and apartment buildings use gas in preference to other fuels, for heating their buildings and providing hot water for the rooms. Many of the large office buildings and stores which have been constructed recently have gas-heating plants installed.

Gas in House Heating

Most of the better homes have a furnace installed and whether it be a hot air, hot water or steam heating plant, the fuel by which it is operated is usually gas, as it is considered the cheapest fuel in this section, and entails the smallest amount of labor and care. In the homes which have no furnace a portable gas heater or gas fireplace are the means most frequently employed to furnish the heat necessary for comfort through the winter. The mild climate makes it quite possible to heat a small house with a heater that would be quite inadequate for a room in the severe climate.

Industrial Gas

In no other city are so large a proportion of the industries carried on by the use of gas as a fuel as in Los Angeles. Bakeries, traveling bake ovens, potato-chip factories, power plants and pumping plants use gas almost exclusively. A large plant for the manufacture of mirrors uses gas for heating the large vats of water containing mercury deposit, in which the glass is dipped.

During the recent power shortage caused by the low water supply, the demand for gas by the industries was considerably increased, although there was little difference in the amount consumed in the homes. In the moving picture theaters the large gas arc lights replaced the electric lighting. Three hundred of these lights were used in the beach cities adjacent to Los Angeles. The amount of gas used in the power plants for generating electricity was greatly increased with the lessening of the water power used for that purpose.

Most of the gas used by the industries is supplied by the Southern California Gas Company. Their sales at present writing are about 152,000,000 cubic feet per day.

The Southern California Gas Company also supplies about 140,000 homes, but most of the residential section is supplied by the Los Angeles Gas and Electric Corporation. This company has one of the largest single units for the manufacture of gas in the world and has laid approximately 1,400 miles of gas mains at present writing. From January 1, 1924, to October, they laid 200 miles of gas mains and placed 31,360 new gas meters. Through the winter months, when more fuel is required for heating, their sales amount to about 140,000,000 cubic feet per day. They supply a mixed gas at a rate of from 53 to 68 cents per cubic foot, and having a heating value of 850 British Thermal Units.

Gas Franchise Approved for Empire Gas & Electric Co.

Albany, N. Y.—The Public Service Commission has approved the application of the Empire Gas and Electric Company for permission and approval to construct and exercise a gas franchise granted to it by the village of Clifton Springs. Ontario county. The village of Clifton Springs is now supplied with gas by the Clifton Springs Sanitarium. The sanitarium is desirous of being relieved of the necessity of supplying this service and is willing to turn over to the petitioner its ex-

isting mains. The Empire Company has a high pressure transmission line which runs between Geneva and Newark, through the village of Phelps, and the company proposes to connect this high pressure line with this distribution system now located in the village of Clifton Springs. The company will be in a position to make all necessary extensions of the distributing system to supply all residents of the village who desire the gas service.

Illinois Power & Light Corp. Adds Home Economics Dept.

Chicago, Ill.—The latest addition to the sales department of the Illinois Power and Light Corporation is the inauguration of a Home Economics Department.

This new department will supervise all home economic activities throughout the company's system.

Miss Jean K. Rich, a graduate of the University of Wisconsin and widely known throughout the Middle West in work of this kind, will be in charge of the department's activities. She was formerly with the Royal Baking Powder Company.

Tri-City Gas Co. Franchise Extended

Gadsden, Ala.—The Gadsden City Council has agreed to extend the franchise of the Tri-City Gas Company for 19 years, making it expire in 1955, provided the plant is sold to Baltimore capitalists who are asking for the extension. An option on the property is held by Baltimore parties, but the deal cannot be closed until the Alabama Public Service Commission grants their permission.

The Baltimore parties who are seeking to purchase this property agree to spend over $40,000 in improving the gas service and extending it to Attalla and Alabama City.

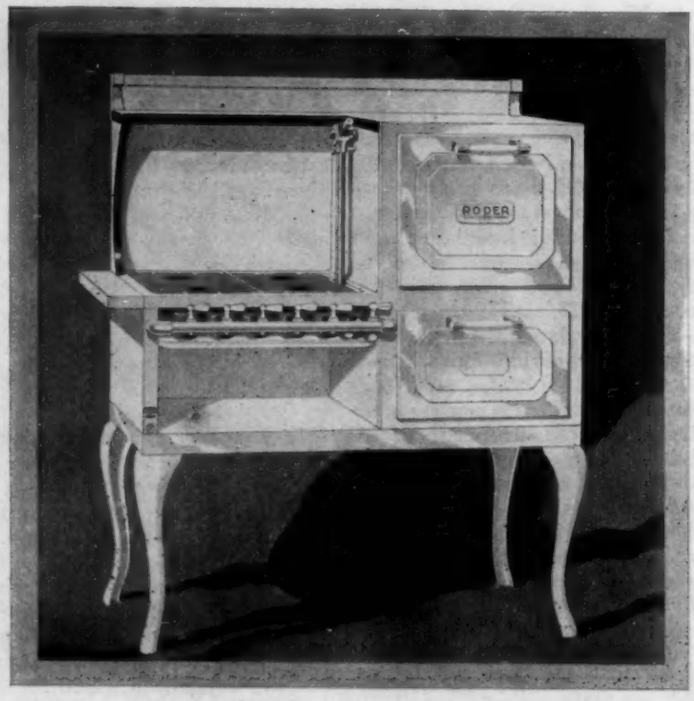
WITH THE EQUIPMENT MAKERS

Unique Sales Campaign

The George D. Roper Corporation, of Rockford, Ill., inaugurated a unique sales campaign to put over a new gas range which they recently brought out.

In the first place, they announced to the gas industry that this new range would be unveiled at 10 a. m. on December 1, 1924. Hundreds of sample ranges were sent out to the various gas companies all over the country and each company placed the range in a show window covered over with a big blue bag. The gas companies ran teaser advertisements which began a week or so before December 1. The Roper stove appeared in their windows simultaneously and on the front of each blue paper bag cover was a large, wide sticker carrying the words: "All over America on December 1, this new Roper will be unveiled nationally."

Invitation cards and letters were sent in many instances to housewives to be present at the demonstration at the unveiling. The Roper Company furnished the gas companies with large posters showing a cut of one of the styles of new ranges, of which there are eight feature models, and also supplied them with a broadside of various-sized advertisements for their daily papers, announcing the unveiling of the range on Dec. 1.

The outstanding features of this gas range as outlined in their announcements are as follows:

1. A smooth, flush range—no extending parts — invisible bolts and hinges—no manifold hangers — compactness with capacity. No waste floor space—side or back may be set close to the wall.
2. Built to correct cooking height. No stooping while cooking.
3. Improved ventilated oven with new flue construction gives 18 per cent greater efficiency.
4. Greater storage space under drip-proof burner tray.
5. Inside oven control. Cooking top flush with oven front. Straight line grate construction.